

## Refine Search

### Search Results -

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| L10 not L11 | 2         |

Database:

US Pre-Grant Publication Full-Text Database  
 US Patents Full-Text Database  
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 EPO Abstracts Database  
 JPO Abstracts Database  
 Derwent World Patents Index  
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L12

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### Search History

DATE: Monday, March 22, 2004    [Printable Copy](#)    [Create Case](#)

| <u>Set</u><br><u>Name</u>                            | <u>Query</u>                    | <u>Hit</u><br><u>Count</u> | <u>Set</u><br><u>Name</u><br>result<br>set |
|--|---------------------------------|----------------------------|--|
| side by side   |                                 |                            |  |
| <i>DB=PGPB,USPT,EPAB,JPAB,DWPI; PLUR=YES; OP=ADJ</i> |                                 |                            |  |
| <u>L12</u>   | l10 not l11                     | 2                          | <u>L12</u>                                 |
| <u>L11</u>   | L10 not l7                      | 10                         | <u>L11</u>                                 |
| <u>L10</u>   | l1 same L9                      | 12                         | <u>L10</u>                                 |
| <u>L9</u>  | volatil\$8                      | 329219                     | <u>L9</u>                                  |
| <u>L8</u>  | L7 not l6                       | 6                          | <u>L8</u>                                  |
| <u>L7</u>  | l4 and l1                       | 8                          | <u>L7</u>                                  |
| <u>L6</u>  | L4 same l1                      | 2                          | <u>L6</u>                                  |
| <u>L5</u>  | L4                              | 1270                       | <u>L5</u>                                  |
| <u>L4</u>  | l2 with L3                      | 1270                       | <u>L4</u>                                  |
| <u>L3</u>  | interfacial                     | 41027                      | <u>L3</u>                                  |
| <u>L2</u>  | microencapsul\$8 or encapsul\$8 | 194722                     | <u>L2</u>                                  |

*DB=USPT,PGPB,JPAB,EPAB,DWPI; PLUR=YES; OP=ADJ*

clomazon\$1 or fenoxan or dimethazon\$1 or fmc57020 or (fmc 57020) or

L1 gamit or ((chlorobenzyl or chlorophenylmethyl or (chlorophenyl methyl)) adj3  
(dimethylisoxazolidin\$3 or (dimethyl adj3 (isoxazolidin\$3 or oxazolidin\$3))))

994 L1

END OF SEARCH HISTORY

## Hit List

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**Search Results - Record(s) 1 through 2 of 2 returned.**☐ 1. Document ID: US 5597780 A**Using default format because multiple data bases are involved.**

L6: Entry 1 of 2

File: USPT

Jan 28, 1997

US-PAT-NO: 5597780

DOCUMENT-IDENTIFIER: US 5597780 A

TITLE: Low volatility formulations of microencapsulated clomazone

DATE-ISSUED: January 28, 1997

## INVENTOR-INFORMATION:

| NAME              | CITY      | STATE | ZIP CODE | COUNTRY |
|-------------------|-----------|-------|----------|---------|
| Lee; Fui-Tseng H. | Princeton | NJ    |          |         |
| Nicholson; Paul   | Trenton   | NJ    |          |         |

US-CL-CURRENT: 504/271; 504/359

|      |       |          |       |        |                |      |           |           |             |        |      |          |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|------|----------|
| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Drawings |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|------|----------|

☐ 2. Document ID: ES 2191067 T3, WO 9614743 A1, AU 9641613 A, ZA 9509724 A, US 5597780 A, EP 792100 A1, BR 9509694 A, CZ 9701416 A3, TW 321585 A, MX 9703575 A1, HU 77708 T, KR 97706728 A, JP 10509709 W, AU 696760 B, AU 9926990 A, IL 115975 A, AU 734106 B, EP 792100 B1, CN 1162902 A, DE 69529471 E, KR 357844 B, CA 2205440 C

L6: Entry 2 of 2

File: DWPI

Sep 1, 2003

DERWENT-ACC-NO: 1996-259473

DERWENT-WEEK: 200365

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TITLE: Prepn. of improved herbicidal clomazone compsns. - with reduced volatility and reduced movement from target area

INVENTOR: LEE, F H; NICHOLSON, P ; LEE, F T H ; LEE, F

PRIORITY-DATA: 1995US-0531499 (September 21, 1995), 1994US-0340699 (November 16, 1994)

## PATENT-FAMILY:

| PUB-NO | PUB-DATE | LANGUAGE | PAGES | MAIN-IPC |
|--------|----------|----------|-------|----------|
|--------|----------|----------|-------|----------|

h e b b g e e e f e ef b e

|                      |                    |   |     |            |
|----------------------|--------------------|---|-----|------------|
| <u>ES 2191067 T3</u> | September 1, 2003  |   | 000 | A01N025/28 |
| <u>WO 9614743 A1</u> | May 23, 1996       | E | 033 | A01N025/28 |
| <u>AU 9641613 A</u>  | June 6, 1996       |   | 000 | A01N025/28 |
| <u>ZA 9509724 A</u>  | August 28, 1996    |   | 032 | A01N000/00 |
| <u>US 5597780 A</u>  | January 28, 1997   |   | 010 | A01N025/28 |
| <u>EP 792100 A1</u>  | September 3, 1997  | E | 000 | A01N025/28 |
| <u>BR 9509694 A</u>  | October 14, 1997   |   | 000 | A01N025/28 |
| <u>CZ 9701416 A3</u> | December 17, 1997  |   | 000 | A01N025/28 |
| <u>TW 321585 A</u>   | December 1, 1997   |   | 000 | A01N025/04 |
| <u>MX 9703575 A1</u> | August 1, 1997     |   | 000 | A01N025/28 |
| <u>HU 77708 T</u>    | July 28, 1998      |   | 000 | A01N025/28 |
| <u>KR 97706728 A</u> | December 1, 1997   |   | 000 | A01N025/28 |
| <u>JP 10509709 W</u> | September 22, 1998 |   | 036 | A01N043/80 |
| <u>AU 696760 B</u>   | September 17, 1998 |   | 000 | A01N025/28 |
| <u>AU 9926990 A</u>  | July 8, 1999       |   | 000 | A01N025/28 |
| <u>IL 115975 A</u>   | December 6, 2000   |   | 000 | A01N025/28 |
| <u>AU 734106 B</u>   | June 7, 2001       |   | 000 | A01N025/28 |
| <u>EP 792100 B1</u>  | January 22, 2003   | E | 000 | A01N025/28 |
| <u>CN 1162902 A</u>  | October 22, 1997   |   | 000 | A01N025/28 |
| <u>DE 69529471 E</u> | February 27, 2003  |   | 000 | A01N025/28 |
| <u>KR 357844 B</u>   | May 1, 2003        |   | 000 | A01N025/28 |
| <u>CA 2205440 C</u>  | July 29, 2003      | E | 000 | A01N025/28 |

734106 B INT-CL (IPC): A01 N 0/00; A01 N 25/04; A01 N 25/28; A01 N 43/48; A01 N 43/72; A01 N 43/80; C07 D 0/00

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KIMC | Draw De |
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| Terms      |                     | Documents |          |           |               |
| L4 same L1 |                     | 2         |          |           |               |

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Search Results - Record(s) 1 through 6 of 6 returned.

☒ 1. Document ID: US 20030022791 A1

Using default format because multiple data bases are involved.

L8: Entry 1 of 6

File: PGPB

Jan 30, 2003

PGPUB-DOCUMENT-NUMBER: 20030022791

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030022791 A1

TITLE: Method of microencapsulating an agricultural active having a high melting point and uses for such materials

PUBLICATION-DATE: January 30, 2003

## INVENTOR-INFORMATION:

| NAME         | CITY         | STATE | COUNTRY | RULE-47 |
|--------------|--------------|-------|---------|---------|
| Asrar, Jawed | Chesterfield | MO    | US      |         |
| Ding, Yiwei  | St. Louis    | MO    | US      |         |

US-CL-CURRENT: 504/116.1; 71/64.07

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KIMC | Draw. Des |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|------|-----------|
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☐ 2. Document ID: US 20010019996 A1

L8: Entry 2 of 6

File: PGPB

Sep 6, 2001

PGPUB-DOCUMENT-NUMBER: 20010019996

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20010019996 A1

TITLE: PROCESS AND COMPOSITIONS PROMOTING BIOLOGICAL EFFECTIVENESS OF EXOGENOUS CHEMICAL SUBSTANCES IN PLANTS

PUBLICATION-DATE: September 6, 2001

## INVENTOR-INFORMATION:

| NAME                  | CITY               | STATE | COUNTRY | RULE-47 |
|-----------------------|--------------------|-------|---------|---------|
| SOULA, GERARD G.      | MEYZIEUX           | MO    | FR      |         |
| MEYRUEIX, REMI        | LYON               | MO    | FR      |         |
| LEMERCIER, ALAIN J.L. | ST. BONNET DE MURE | MO    | FR      |         |

|                     |                      |    |
|---------------------|----------------------|----|
| CAISSE, PHILIPPE G. | SAINT BONNET DE MURE | FR |
| WARD, ANTHONY J.I.  | CLAYTON              | US |
| GILLESPIE, JANE L.  | ST. LOUIS            | US |
| BRINKER, RONALD J.  | ELLISVILLE           | US |

US-CL-CURRENT: [504/189](#); [424/405](#), [504/194](#), [504/199](#), [514/553](#), [514/661](#), [514/740](#)

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWC | Draw De |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|-----|---------|
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☐ 3. Document ID: US 6500783 B1

L8: Entry 3 of 6

File: USPT

Dec 31, 2002

US-PAT-NO: 6500783

DOCUMENT-IDENTIFIER: US 6500783 B1

TITLE: Process and compositions promoting biological effectiveness of exogenous chemical substances in plants

DATE-ISSUED: December 31, 2002

## INVENTOR-INFORMATION:

| NAME                   | CITY               | STATE | ZIP CODE | COUNTRY |
|------------------------|--------------------|-------|----------|---------|
| Bryson; Nathan J.      | Millery            |       |          | FR      |
| Soula; Olivier         | Lyon               |       |          | FR      |
| Lemercier; Alain J. L. | St. Bonnet de Mure |       |          | FR      |
| Meyrueix; Remi         | Lyon               |       |          | FR      |
| Soula; Gerard G.       | Meyzieux           |       |          | FR      |

US-CL-CURRENT: [504/206](#); [504/362](#)

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWC | Draw De |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|-----|---------|
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☐ 4. Document ID: US 6133199 A

L8: Entry 4 of 6

File: USPT

Oct 17, 2000

US-PAT-NO: 6133199

DOCUMENT-IDENTIFIER: US 6133199 A

TITLE: Process and compositions promoting biological effectiveness of exogenous chemical substances in plants

DATE-ISSUED: October 17, 2000

## INVENTOR-INFORMATION:

| NAME             | CITY     | STATE | ZIP CODE | COUNTRY |
|------------------|----------|-------|----------|---------|
| Soula; Gerard G. | Meyzieux |       |          | FR      |
| Meyrueix; Remi   | Lyons    |       |          | FR      |

|                        |                   |    |
|------------------------|-------------------|----|
| Lemercier; Alain J. L. | St Bonnet de Mure | FR |
| Bryson; Nathan J.      | Millery           | FR |
| Soula; Olivier         | Lyons             | FR |
| Ward; Anthony J. I.    | Clayton           | MO |
| Gillespie; Jane L.     | St. Louis         | MO |
| Brinker; Ronald J.     | Ellisville        | MO |

US-CL-CURRENT: 504/206; 504/365

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Drawings |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|------|----------|
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☒ 5. Document ID: US 5925464 A

L8: Entry 5 of 6

File: USPT

Jul 20, 1999

US-PAT-NO: 5925464

DOCUMENT-IDENTIFIER: US 5925464 A

TITLE: Microencapsulation process and product

DATE-ISSUED: July 20, 1999

## INVENTOR-INFORMATION:

| NAME                     | CITY       | STATE | ZIP CODE | COUNTRY |
|--------------------------|------------|-------|----------|---------|
| Mulqueen; Patrick Joseph | Oxon       |       |          | GB      |
| Smith; Geoff             | Oxon       |       |          | GB      |
| Lubetkin; Steven D.      | Zionsville | IN    |          |         |

US-CL-CURRENT: 428/402.2; 264/4.1, 264/4.3, 264/4.32, 264/4.33, 264/4.6, 264/4.7,  
427/213.3, 427/213.31, 427/213.32, 427/213.33, 427/213.34, 428/402.21, 428/402.24

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Drawings |
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☐ 6. Document ID: US 4936901 A

L8: Entry 6 of 6

File: USPT

Jun 26, 1990

US-PAT-NO: 4936901

DOCUMENT-IDENTIFIER: US 4936901 A

TITLE: Formulations of water-dispersible granules and process for preparation thereof

DATE-ISSUED: June 26, 1990

## INVENTOR-INFORMATION:

| NAME                  | CITY      | STATE | ZIP CODE | COUNTRY |
|-----------------------|-----------|-------|----------|---------|
| Surgant, Sr.; John M. | Ladue     | MO    |          |         |
| Deming; John M.       | Hazelwood | MO    |          |         |

US-CL-CURRENT: 504/133; 504/359

|      |       |          |       |        |                |      |           |           |             |        |     |         |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|-----|---------|
| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KMC | Draw De |
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L8: Entry 1 of 6

File: PGPB

Jan 30, 2003

DOCUMENT-IDENTIFIER: US 20030022791 A1

TITLE: Method of microencapsulating an agricultural active having a high melting point and uses for such materials

Summary of Invention Paragraph:

[0011] Another commonly used method for the encapsulation of liquid droplets involves the generation of a polyurea shell around an active-containing core by interfacial polymerization at the surface of the droplets. Advantages of using a polyurea shell include that the material is generally non-phytotoxic, its permeability characteristics can be controlled, and the shell can be formed at relatively low temperatures--in fact, polymerization temperatures of lower than 90.degree. C. are almost always used, and temperatures of from about 40.degree. C.-70.degree. C., are preferred.

Summary of Invention Paragraph:

[0017] In U.S. Pat. No. 4,738,898, Vivant describes microencapsulation of a variety of materials within polyurea skin membranes by interfacial polyaddition involving a polyisocyanato hydrophobic liquid in an essentially aqueous medium. The polyisocyanato hydrophobic liquid contained the dissolved material to be encapsulated, an aliphatic diisocyanate and an isocyanurate ring trimer of an aliphatic diisocyanate. The isocyanate materials were reacted with a polyamine to form a polyurea shell material. The microcapsules described by Vivant had leakproof walls that were designed for the microencapsulation of colorants and the production of pressure-sensitive carbonless paper, for example. The microcapsules were designed to maintain the encapsulated material until the capsule was ruptured, and would not have been suitable for the controlled release of the encapsulated materials through the walls of the capsule.

Summary of Invention Paragraph:

[0092] The present invention is also directed to a novel method of producing a microencapsulated form of a high melting material which method is free of the use of solvents, the method comprising mixing a high melting material and a melting point depressant to form a composition which is free of solvents; heating the composition to a temperature at which the composition is a liquid, but which temperature is below the normal melting points of both the high melting material and the melting point depressant; forming the liquid composition into small droplets while maintaining said liquid composition at a temperature below the normal melting points of both the high melting material and the melting point depressant; and enclosing each droplet in a non-water soluble shell by interfacial polymerization to form a microcapsule.

Detail Description Paragraph:

[0110] In one embodiment, this disclosure describes the microencapsulation of a first agricultural active, such as silthiopham, in a polyurea shell, where the encapsulation is achieved by an interfacial polymerization process. Two processes are disclosed for preparing the emulsion necessary for the interfacial polymerization, one involves encapsulation of the active in solution in a non-aromatic organic solvent and the other involves encapsulation of a blend of the active and a melting point depressant.

Detail Description Paragraph:

[0113] One embodiment of the present invention advantageously extends the state of the art to include the encapsulation of almost any high melting solid by a method that includes interfacial polymerization, but without the necessity of using a solvent to dissolve the high melting solid. In U.S. Pat. No. 5,310,721, to Lo, it is taught that microcapsules prepared by interfacial polycondensation can advantageously contain materials which have a variety of uses, such as for dyes, inks, color formers, pharmaceuticals, cosmetics, flavoring materials, agricultural chemicals, and the like. The Lo patent states that any liquid, oil, low melting solid, or solvent-soluble material into which a first wall-forming material can be dissolved and which is non-reactive with said wall-forming material may be encapsulated with this technique.

Detail Description Paragraph:

[0114] The present invention extends the state of the art to include the encapsulation of almost any high melting solid by forming a mixture of the high melting solid with a melting point depressant that is a solid at conventional interfacial polymerization temperatures (for polyurea formation, this is about 50.degree. C.-90.degree. C.), but is capable of combining with the high melting solid to form a eutectic mixture, where the melting point of the eutectic mixture is sufficiently low to permit the mixture to be encapsulated by known interfacial polymerization techniques, such as referred to in the Lo patent. It is preferable, but not required, that the melting point depressant is a material of the same type as the high melting solid. For example, it is particularly advantageous when both are dyes, inks, pharmaceuticals, flavoring materials, agricultural chemicals, and the like.

Detail Description Paragraph:

[0115] As used herein, a "material having a high normal melting point", which is also referred to herein as a "high melting material", is a material which has a normal melting point temperature that is higher than the upper limit of the temperature range that is conventionally used to carry out the interfacial polymerization method that is being used to form the encapsulating shell around the material. For example, when the interfacial polymerization method comprises the formation of a polyurea shell, the preferred temperature range that is conventionally used is about 50.degree. C. to about 90.degree. C., more preferably, about 50.degree. C. to about 80.degree. C., even more preferably, about 50.degree. C. to about 70.degree. C., and yet more preferably, about 50.degree. C. to about 60.degree. C. Therefore, a high melting material, in this instance, is one having a normal melting point that is above 90.degree. C., or above the upper limit of another of the preferred ranges.

Detail Description Paragraph:

[0240] amitrole, clomazone and fluridone,

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L8: Entry 2 of 6

File: PGPB

Sep 6, 2001

DOCUMENT-IDENTIFIER: US 20010019996 A1

TITLE: PROCESS AND COMPOSITIONS PROMOTING BIOLOGICAL EFFECTIVENESS OF EXOGENOUS CHEMICAL SUBSTANCES IN PLANTS

Summary of Invention Paragraph:

[0026] A different approach, illustrated in European Patent Specification No. 0 148 169, is to encapsulate a water-soluble herbicide such as glyphosate in a polymeric shell by interfacial polycondensation. In this technique, a water-in-oil emulsion having a lipophilic emulsifier based on alkylated polyvinylpyrrolidone is used. Polymerization to form the shell, by reaction of comonomers, occurs at the oil-water interface of the emulsion containing the herbicide, resulting in formation of a shell that encapsulates the herbicide.

Brief Description of Drawings Paragraph:

[0163] For example, more than one exogenous chemical substance can be included. An additional anionic exogenous chemical substance can be included, selected for example from those hereinbefore listed. Alternatively or in addition, an exogenous chemical substance that is other than anionic as defined herein can be included. For example, a glyphosate composition of the invention can optionally contain, in addition to glyphosate, an anionic herbicidal compound such as acifluorfen, asulam, benazolin, bentazon, bialaphos, clopyralid, 2,4-D, 2,4-DB, dalapon, dicamba, dichlorprop, diclofop, fenoxaprop, flampop, fluazifop, fluoroglyphofen, fluoxypyr, fomesafen, fosamine, glufosinate, haloxyfop, imazameth, imazamethabenz, imazamox, imazapic, imazapyr, imazaquin, imazethapyr, MCPA, MCPB, mecoprop, methylarsonic acid, nonanoic acid, picloram, sulfamic acid, 2,3,6-TBA, TCA and triclopyr. Such additional anionic compound is present as salt(s) comprising A.sup.+, and optionally B.sup.+, cations as described herein. Similarly, a composition of the invention containing salts of an anionic herbicide can optionally contain a herbicidal compound that is other than anionic, such as for example an ester derivative of an anionic herbicide, or a herbicide selected from acetochlor, aclonifen, alachlor, ametryn, amidosulfuron, anilofos, atrazine, azafenidin, azimsulfuron, benfluralin, benfuresate, bensulfuron-methyl, bensulide, benzofenap, bifenox, bromobutide, bromofenoxim, butachlor, butamifos, butralin, butroxydim, butylate, cafenstrole, carbetamide, carfentrazone-ethyl, chlomethoxyfen, chlorbromuron, chloridazon, chlorimuron-ethyl, chlorotoluron, chlornitrofen, chlorotoluron, chlorpropham, chlorsulfuron, chlorthal-dimethyl, chlorthiamid, cinmethylin, cinosulfuron, clethodim, clodinafop-propargyl, clomazone, clomeprop, cloransulam-methyl, cyanazine, cycloate, cyclosulfamuron, cycloxydim, cyhalofop-butyl, daimuron, desmedipham, desmetryn, dichlobenil, diclofop-methyl, diflufenican, dimefuron, dimepiperate, dimethachlor, dimethametryn, dimethenamid, dinitramine, dinoterb, diphenamid, dithiopyr, diuron, EPTC, esprocarb, ethalfluralin, ethametsulfuron-methyl, ethofumesate, ethoxysulfuron, etobenzanid, fenoxaprop-ethyl, fenuron, flampop-methyl, flazasulfuron, fluazifop-butyl, fluchloralin, flumetsulam, flumiclorac-pentyl, flumioxazin, fluometuron, fluorchloridone, fluoroglyphofen-ethyl, flupoxam, flurenol, fluridone, fluoxypyr-1-methylheptyl, flurtamone, fluthiacet-methyl, fomesafen, halosulfuron, haloxyfop-methyl, hexazinone, imazosulfuron, indanofan, isoproturon, isouron, isoxaben, isoxaflutole, isoxapyrifop, lactofen, lenacil, linuron, mefenacet, metamitron, metazachlor, methabenzthiazuron, methylglyphosate, metobenzuron, metobromuron, metolachlor, metosulam, metoxuron, metribuzin, metsulfuron, molinate, monolinuron,

naproanilide, napropamide, naptalam, neburon, nicosulfuron, norflurazon, orbencarb, oryzalin, oxadiargyl, oxadiazon, oxasulfuron, oxyfluorfen, pebulate, pendimethalin, pentanochlor, pentoxazone, phenmedipham, piperophos, pretilachlor, primisulfuron, prodiamine, prometon, prometryn, propachlor, propanil, propaquizafop, propazine, propham, propisochlor, propyzamide, prosulfocarb, prosulfuron, pyraflufen-ethyl, pyrazolynate, pyrazosulfuron-ethyl, pyrazoxyfen, pyributicarb, pyridate, pyriminobac-methyl, quinclorac, quinmerac, quizalofop-ethyl, rimsulfuron, sethoxydim, siduron, simazine, simetryn, sulcotrione, sulfentrazone, sulfometuron, sulfosulfuron, tebutam, tebuthiuron, terbacil, terbumeton, terbuthylazine, terbutryn, thenylchlor, thiazopyr, thifensulfuron, thiobencarb, tiocarbazil, tralkoxydim, triallate, triasulfuron, tribenuron, trietazine, trifluralin, triflusulfuron and vemolate.

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L8: Entry 3 of 6

File: USPT

Dec 31, 2002

DOCUMENT-IDENTIFIER: US 6500783 B1

TITLE: Process and compositions promoting biological effectiveness of exogenous chemical substances in plants

Brief Summary Text (28):

A different approach, illustrated in European Patent Specification No. 0 148 169, is to encapsulate a water-soluble herbicide such as glyphosate in a polymeric shell by interfacial polycondensation. In this technique, a water-in-oil emulsion having a lipophilic emulsifier based on alkylated polyvinylpyrrolidone is used. Polymerization to form the shell, by reaction of comonomers, occurs at the oil-water interface of the emulsion containing the herbicide, resulting in formation of a shell that encapsulates the herbicide.

Brief Summary Text (146):

For example, more than one exogenous chemical substance can be included. An additional anionic exogenous chemical substance can be included, selected for example from those hereinbefore listed. Alternatively or in addition, an exogenous chemical substance that is other than anionic as defined herein can be included. For example, a glyphosate composition of the invention can optionally contain, in addition to glyphosate, an anionic herbicidal compound such as acifluorfen, asulam, benazolin, bentazon, bialaphos, carfentrazone, clopyralid, 2,4-D, 2,4-DB, dalapon, dicamba, dichlorprop, diclofop, fenoxaprop, flamprop, fluazifop, fluoroglycofen, fluroxypyr, fomesafen, fosamine, glufosinate, haloxyfop, imazameth, imazamethabenz, imazamox, imazapic, imazapyr, imazaquin, imazethapyr, MCPA, MCPB, mecoprop, methylarsonic acid, nonanoic acid, picloram, sulfamic acid, 2,3,6-TBA, TCA and triclopyr. Such additional anionic compound is present as salt(s) comprising [A.sup.n+ ], and optionally [B.sup.+ ], cations as described herein. Similarly, a composition of the invention containing salts of an anionic herbicide can optionally contain a herbicidal compound that is other than anionic, such as for example an ester derivative of an anionic herbicide, or a herbicide selected from acetochlor, aclonifen, alachlor, ametryn, amidosulfuron, anilofos, atrazine, azafenidin, azimsulfuron, benfluralin, benfuresate, bensulfuron-methyl, bensulide, benzofenap, bifenox, bromobutide, bromofenoxim, butachlor, butamifos, butralin, butroxydim, butylate, cafenstrole, carbetamide, carfentrazone-ethyl, chlomethoxyfen, chlorbromuron, chloridazon, chlorimuron-ethyl, chlorotoluron, chlornitrofen, chlorotoluron, chlorpropham, chlorsulfuron, chlorthal-dimethyl, chlorthiamid, cinmethylin, cinosulfuron, clethodim, clodinafop-propargyl, clomazone, clomeprop, cloransulam-methyl, cyanazine, cycloate, cyclosulfamuron, cycloxydim, cyhalofop-butyl, daimuron, desmedipham, desmetryn, dichlobenil, diclofop-methyl, diflufenican, dimefuron, dimepiperate, dimethachlor, dimethametryn, dimethenamid, dinitramine, dinoterb, diphenamid, dithiopyr, diuron, EPTC, esprocarb, ethalfluralin, ethametsulfuron-methyl, ethofumesate, ethoxysulfuron, etobenzanid, fenoxaprop-ethyl, fenuron, flamprop-methyl, flazasulfuron, fluazifop-butyl, fluchloralin, flumetsulam, flumiclorac-pentyl, flumioxazin, fluometuron, fluorchloridone, fluoroglycofen-ethyl, flupoxam, flurenol, fluridone, fluroxypyr-1-methylheptyl, flurtamone, fluthiacet-methyl, fomesafen, halosulfuron, haloxyfop-methyl, hexazinone, imazosulfuron, indanofan, isoproturon, isouron, isoxaben, isoxaflutole, isoxapyrifop, lactofen, lenacil, linuron, mefenacet, metamitron, metazachlor, methabenzthiazuron, methyldymron, metobenzuron, metobromuron, metolachlor, metosulam, metoxuron, metribuzin,

metsulfuron, molinate, monolinuron, naproanilide, napropamide, naptalam, neburon, nicosulfuron, norflurazon, orbencarb, oryzalin, oxadiargyl, oxadiazon, oxasulfuron, oxyfluorfen, pebulate, pendimethalin, pentanochlor, pentoxazone, phenmedipham, piperophos, pretilachlor, primisulfuron, prodiamine, prometon, prometryn, propachlor, propanil, propaquizafop, propazine, propham, propisochlor, propyzamide, prosulfocarb, prosulfuron, pyraflufen-ethyl, pyrazolynate, pyrazosulfuron-ethyl, pyrazoxyfen, pyributicarb, pyridate, pyriminobac-methyl, quinclorac, quinmerac, quizalofop-ethyl, rimsulfuron, sethoxydim, siduron, simazine, simetryn, sulcotrione, sulfentrazone, sulfometuron, sulfosulfuron, tebutam, tebuthiuron, terbacil, terbumeton, terbuthylazine, terbutryn, thenylchlor, thiazopyr, thifensulfuron, thiobencarb, tiocarbazil, tralkoxydim, triallate, triasulfuron, tribenuron, trietazine, trifluralin, triflusulfuron and vernolate.

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L8: Entry 5 of 6

File: USPT

Jul 20, 1999

DOCUMENT-IDENTIFIER: US 5925464 A

TITLE: Microencapsulation process and product

Abstract Text (1):

Microencapsulated compositions, useful, for example, as pesticidal formulations, were prepared a process in which the microcapsules containing the encapsulated material are formed in an interfacial polycondensation reaction carried out in the presence of one polyvinylalcohol, a different polyvinylalcohol is added, and the resulting mixture is spray dried.

Brief Summary Text (6):

U.S. Pat. No. 4,936,901 (Monsanto) discloses an alternative method of encapsulation, in which microcapsules containing the active material are formed by means of an interfacial polycondensation reaction, involving an isocyanate/polyamine reaction. The resulting interfacially polymerised microcapsules are subsequently spray dried. This reference mentions that PVA may be used as a suspension adjuvant in the spray drying step. Again, this method results in the production of microcapsules with uncontrollable release characteristics. Also, some active materials show a tendency to diffuse out of the interfacially polymerised microcapsules during storage, thus producing crystallisation (in the case of actives normally solid at ambient temperatures). Another difficulty with this method is that the products which result all have slow release characteristics, because of their large particle size distribution and thick polymer wall.

Brief Summary Text (9):

We have found by incorporating a PVA into an interfacial polycondensation system for producing microcapsules, and subsequently spray drying the resulting microcapsules in the presence of the PVA and optionally a further quantity of PVA which may be the same or different from the one adopted in the microencapsulation step, microcapsules can be obtained which show improved storage stability, especially to the leaching of the active material from the resulting microcapsules, particularly when the microcapsules are small in size, (for example less than 5 micrometer).

Brief Summary Text (10):

Accordingly, in a first embodiment of the invention, there is provided a process for preparing an encapsulated material, which process comprises forming microcapsules containing the material by an interfacial polycondensation reaction, and spray drying the resulting microcapsules in the presence of a polyvinylalcohol (PVA), wherein the PVA is present during the interfacial polycondensation reaction forming the microcapsules.

Brief Summary Paragraph Table (1):

amitraz phosalone azinphos-ethyl phosfolan  
azinphos-methyl phosmet benzoximate promecarb bifenthrin quinalphos binapacryl  
resmethrin bioresmethrin temephos chlorpyrifos tetramethrin chlorpyrifos-methyl  
xylylcarb cyanophos acrinathrin cyfluthrin allethrin cypermethrin benfuracarb  
bromophos bioallethrin bromopropylate bioallethrin S butacarboxim bioresmethrin  
butoxy-carboxin buprofezin chlordimeform chlorfenvinphos chlorobenzilate

chlorflurazuron chloropropylate chlormephos chlorophoxim cycloprothrin fenamiphos  
 betacyfluthrin fenobucarb cyhalothrin gamma-HCH cambda-cyhalothrin methidathion  
 alpha-cypermethrin deltamethrin beta-cypermethrin dicofol cyphenothrin  
 dioxabenzafos dimeton-S-methyl dioxacarb dichlorvos endosulfan disulfoton  
 EPNethiofencarb edifenphos dinobuton empenthrin tetradifon esfenvalerate  
 tralomethrin ethoprophos N-2,3-dihydro-3-methyl-1,3 etofenprox thiazol-2-ylidene-  
 2,4- etrimphos xylydene fenazaquin parathion methyl fenitrothion fenthioncarb  
 phenothrin fenpropathrin phenthoate fenthion pirimiphos-ethyl fenvalerate  
 pirimiphos-methyl flucythrinate profenofos flufenoxuron propaphos tau-fluvalinate  
 propargite formothion propetamphospyrachlofos hexaflumuron tefluthrin hydroprene  
 terbufos isofenphos tetrachlorinphos isoprocab tralomethrin isoxathion triazophos  
 malathion pyrachlofos mephospholan tefluthrin methoprene terbufos methoxychlor  
 tetrachlorinphos mevinphos tralomethrin permethrin triazophos the following  
 fungicides:- benalaxyl biteranol bupirimate cyproconazole carboxin tetraconazole  
 dodemorph difenoconazole dodine dimethomorph fenarimol diniconazole ditalimfos  
 ethoxyquin myclobutanil etridiazole nuarimol fenpropidin oxycarboxin fluchloralin  
 penconazole flusilazole prochloraz imibenconazole tolclofos-methyl myclobutanil  
 triadimefon propiconazole triadimenol pyrifenox azaconazole tebuconazole  
 epoxyconazole tridemorph fenpropimorph triflumizole the following herbicides:- 2,4-  
 D esters bifenox 2,4-DB esters bromoxynil esters acetochlor bromoxynil aclonifen  
 butachlor alachlor butamifos anilophos butralin benfluralin butylate benfuresate  
 carbetamide bensulide chlomitrofen benzoylprop-ethyl chlorpropham cinmethylin  
 flurochloralin haloxyfop clethodim ethoxyethyl clomazone haloxyfop-methyl  
 clopyralid esters ioxynil esters CMPP esters isopropalin cycloate MCPA esters  
 cycloxydim mecoprop-P esters desmedipham metolachlor dichlorprop esters monalide  
 diclofop-methyl diethyl napropamide dimethachlor nitrofen dinitramine oxadiazon  
 ethalfluralin oxyfluorfen ethofumesate pendimethalin fenobucarb phenisopham  
 fenoxaprop ethyl phenmedipham fluazifop picloram esters fluazifop-P pretilachlor  
 fluchloralin profluralin flufenoxim propachlor flumetralin propanil flumetralin  
 propaquizafop fluorodifen pyridate fluoroglycofen ethyl quizalofop-P fluoroxyppyr  
 esters triciopyr esters flurecol butyl tridiphane trifluralin

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**CLAIMS:**

1. A process for preparing an encapsulated material, which process comprises forming microcapsules containing the material by an interfacial polycondensation reaction carried out in the presence of a first polyvinylalcohol, adding a second polyvinyl alcohol, and spray drying the resulting mixture, with the proviso that said first polyvinylalcohol and second polyvinylalcohol are different.

14. Microcapsules containing an encapsulated material obtained by a process which comprises forming microcapsules by an interfacial polycondensation reaction carried out in the presence of a first polyvinylalcohol, adding a second polyvinylalcohol, and spray drying the resulting mixture, with the proviso that said first polyvinylalcohol and second polyvinylalcohol are different.



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L8: Entry 6 of 6

File: USPT

Jun 26, 1990

DOCUMENT-IDENTIFIER: US 4936901 A

TITLE: Formulations of water-dispersible granules and process for preparation thereof

Brief Summary Text (7):

Various methods are known in the art for microencapsulation of water-insoluble pesticides via interfacial polymerization reaction. U.S. Pat. Nos. 4,360,376, 3,429,827, 3,577,515 and 4,280,833 provide a good summary of the methods which are available. U.S. Pat. No. 4,280,833 describes the microencapsulation of concentrated amounts of water-insoluble pesticide materials on the order of 480-700 grams per liter, this previously unattainable high concentration offers a distinct energy saving advantage when water driveoff is required to convert the liquid to a solid.

Brief Summary Text (61):

There are several techniques known for micro-encapsulating pesticide materials; see for example MICROENCAPSULATION PROCESSES AND APPLICATIONS edited by Jan E. Vandegaer, 1974 Plenum Press, New York and London. Such processes include coacervation encapsulation, interfacial condensation polymerization, and fluid bed coating. The preferred method for use herein is interfacial polycondensation microencapsulation and especially the process described by U.S. Pat. No. 4,280,833 as well as Ser. No. 619,752 filed June 12, 1984, Ser. No. 655,827 filed Oct. 1, 1984, and Ser. No. 566,108 filed Dec. 27, 1983, all of which describe encapsulation of concentrated amounts of water-insoluble pesticides, i.e., greater than 480 grams of water-insoluble material per liter of total composition. High concentration microencapsulation is achieved by use of specific emulsifiers and these higher starting concentrations are of both energy and process benefit in accomplishing a dry product.

Brief Summary Text (62):

Briefly, microencapsulation via interfacial condensation polymerization reaction involves encapsulating a water-immiscible material within a shell wall of polycondensate, e.g., polyurea, polyamide, polysulfonamide, polyester, polycarbonate, or polyurethane by (1) providing an aqueous solution containing an emulsifier capable of forming a stable oil-in-water emulsion when concentrated amounts of discontinuous phase liquid are present vis-a-vis the continuous or aqueous phase liquid; (2) forming an organic or discontinuous phase liquid which consists essentially of the water-insoluble pesticide or plant growth regulant (the material to be encapsulated) with a first shell wall monomer dissolved therein; (3) addition of the discontinuous liquid to the aqueous phase, with agitation, to form a dispersion of small droplets discontinuous phase liquid throughout the aqueous phase i.e., an oil-in-water emulsion is formed); (4) addition of a second water-miscible shell wall monomer, with continued agitation, to the oil-in-water emulsion; and (5) reaction of the second shell wall monomer with the first shell wall monomer to form a polymeric shell wall about the water-insoluble pesticide.

Brief Summary Text (65):

The water-insoluble pesticide(s) which is the active agent of the water-dispersible granule of the invention and which is encapsulated is suitably any liquid, oil,

meltable solid, solvent-soluble, or copesticide-soluble active ingredient, into which the first shell wall monomer can be dissolved and which is non-reactive thereto. Such water-immiscible pesticides include as representative herbicides, e.g., .alpha.-chloro-2',6'-diethyl-N-methoxymethyl acetanilide (commonly known as alachlor), N-butoxymethyl-.alpha.-chloro-2',6'-diethylacetanilide (commonly known as butachlor), 2'-methyl-6'-ethyl-N-(1-methoxy-prop-2-yl)-2-chloroacetanilide (commonly known as metolachlor), 2'-t-butyl-2-chloro-N-methoxymethyl-6'-methylacetanilide, .alpha.-chloro-N-(2-methoxy-6-methylphenyl)-N-(1-methylethoxymethyl)-acetamide, .alpha.-chloro-N-(ethoxy-methyl)-N-[2-methyl-6-(trifluoro-methyl)phenyl]-acetamide, .alpha.-chloro-N-methyl-N-[2-methyl-6-(3-methylbutoxy) phenyl] acetamide, .alpha.-chloro-N-methyl-N-(2-methyl-6-propoxyphenyl)acetamide, N-(2-butoxy-6-methylphenyl)-.alpha.-chloro-N-methyl acetamide, N-(2,6-dimethylphenyl)-N-(1-pyrazolylmethyl)chloroacetanilide (common name "metazochlor"), N,N-diallyl-2-chloroacetamide (common name "allidochlor"), isobutyl ester of (2,4-dichlorophenoxy)acetic acid, 2-chloro-N-(ethoxymethyl)-6'-ethyl-o-acetotoluidide (commonly known as acetochlor), 1-(1-cyclohexen-1-yl)-3-(2-fluorophenyl)-1-methyl urea, S-2,3,3-trichloroallyldiisopropyl thiocarbamate (commonly known as "triallate"), S-2,3-dichloroallyldiisopropylthiocarbamate (commonly known as "diallate"), .alpha.,.alpha.,.alpha.-trifluoro-2, 6-dinitro-N,N-dipropyl-p-toluidine (commonly known as "trifluralin"), 2-(2-chlorophenyl)methyl-4,4-dimethyl-3-isoxazolidinone; 3,5-pyridinedicarbothioc acid, 2-(difluoromethyl)-4-(2-methylpropyl)-6-(trifluoromethyl)-, S,S-dimethylester; 3-pyridinecarboxylic acid, 2-(difluoromethyl)-5-(4,5-dihydro-2-thiazolyl)-4-(2-methylpropyl)-6-(trifluoromethyl)-, methyl ester; 3-pyridinecarboxylic acid, 2-(difluoromethyl)-4-(2-methylpropyl)-5-(1H-pyrazol-1-ylcarbonyl)-6-trifluoromethyl-, methyl ester; 5-methyl-4-methoxycarbonyl-3-(3'-methoxycarbonylphenoxy)-pyrazole and 5-methyl-4-methoxycarbonyl-3-(3'-methoxyphenoxy) pyrazole.

#### Brief Summary Text (95):

In the interfacial condensation encapsulation process used herein, the water-insoluble pesticide containing the first shell wall monomer dissolved therein comprises the organic or discontinuous phase liquid. The water-immiscible pesticide acts as the solvent for the first shell wall monomer thus avoiding the use of other water-immiscible organic solvents and allowing for a concentrated amount of water-insoluble pesticide in the final encapsulated product. The water-insoluble pesticide and first shell wall component are pre-mixed to obtain a homogeneous discontinuous phase liquid before addition to, and emulsification in, the aqueous phase to form the oil-in-water emulsion.

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Search Results - Record(s) 1 through 10 of 10 returned.

☒ 1. Document ID: US 20030224031 A1

Using default format because multiple data bases are involved.

L11: Entry 1 of 10

File: PGPB

Dec 4, 2003

PGPUB-DOCUMENT-NUMBER: 20030224031

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20030224031 A1

TITLE: Delivery system for pesticides and crop-yield enhancement products using micro-encapsulated active ingredients in extruded granules

PUBLICATION-DATE: December 4, 2003

INVENTOR-INFORMATION:

| NAME                | CITY     | STATE | COUNTRY | RULE-47 |
|---------------------|----------|-------|---------|---------|
| Heier, John L.      | Live Oak | CA    | US      |         |
| Schulteis, David T. | Fresno   | CA    | US      |         |

US-CL-CURRENT: 424/408; 71/31

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Drawings |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|------|----------|
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|------|----------|

☒ 2. Document ID: US 20010041659 A1

L11: Entry 2 of 10

File: PGPB

Nov 15, 2001

PGPUB-DOCUMENT-NUMBER: 20010041659

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20010041659 A1

TITLE: Microencapsulated clomazone in the presence of fat and resin

PUBLICATION-DATE: November 15, 2001

INVENTOR-INFORMATION:

| NAME             | CITY       | STATE | COUNTRY | RULE-47 |
|------------------|------------|-------|---------|---------|
| Becker, John M.  | Flemington | NJ    | US      |         |
| Szamosi, Janos   | Washington | NJ    | US      |         |
| Garcia, Hylsa E. | Elizabeth  | NJ    | US      |         |

US-CL-CURRENT: 504/140

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KMC | Draw De |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|-----|---------|
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|-----|---------|

☐ 3. Document ID: US 6440902 B1

L11: Entry 3 of 10

File: USPT

Aug 27, 2002

US-PAT-NO: 6440902

DOCUMENT-IDENTIFIER: US 6440902 B1

**\*\* See image for Certificate of Correction \*\***

TITLE: Combination of two or more active ingredients using microencapsulated formulations

DATE-ISSUED: August 27, 2002

## INVENTOR-INFORMATION:

| NAME           | CITY       | STATE | ZIP CODE | COUNTRY |
|----------------|------------|-------|----------|---------|
| Szamosi; Janos | Washington | NJ    |          |         |

US-CL-CURRENT: 504/138; 504/139

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KMC | Draw De |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|-----|---------|
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☒ 4. Document ID: US 6380133 B2

L11: Entry 4 of 10

File: USPT

Apr 30, 2002

US-PAT-NO: 6380133

DOCUMENT-IDENTIFIER: US 6380133 B2

TITLE: Microencapsulated clomazone in the presence of fat and resin

DATE-ISSUED: April 30, 2002

## INVENTOR-INFORMATION:

| NAME             | CITY       | STATE | ZIP CODE | COUNTRY |
|------------------|------------|-------|----------|---------|
| Becker; John M.  | Flemington | NJ    |          |         |
| Szamosi; Janos   | Washington | NJ    |          |         |
| Garcia; Hylsa E. | Elizabeth  | NJ    |          |         |

US-CL-CURRENT: 504/140; 504/265

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KMC | Draw De |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|-----|---------|
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☒ 5. Document ID: US 6218339 B1

L11: Entry 5 of 10

File: USPT

Apr 17, 2001

US-PAT-NO: 6218339

DOCUMENT-IDENTIFIER: US 6218339 B1

TITLE: Microencapsulated clomazone in the presence of fat and resin

DATE-ISSUED: April 17, 2001

## INVENTOR-INFORMATION:

| NAME             | CITY       | STATE | ZIP CODE | COUNTRY |
|------------------|------------|-------|----------|---------|
| Becker; John M.  | Flemington | NJ    |          |         |
| Szamosi; Janos   | Washington | NJ    |          |         |
| Garcia; Hylsa E. | Elizabeth  | NJ    |          |         |

US-CL-CURRENT: 504/140; 504/265

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KIMC | Draw De |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|------|---------|
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☐ 6. Document ID: US 5783520 A

L11: Entry 6 of 10

File: USPT

Jul 21, 1998

US-PAT-NO: 5783520

DOCUMENT-IDENTIFIER: US 5783520 A

TITLE: Microencapsulated herbicidal compositions comprising clomazone and edible oils

DATE-ISSUED: July 21, 1998

## INVENTOR-INFORMATION:

| NAME               | CITY               | STATE | ZIP CODE | COUNTRY |
|--------------------|--------------------|-------|----------|---------|
| Anderson; Helen L. | St. Charles        | MO    |          |         |
| Hakimi; Salim M.   | Chesterfield       | MO    |          |         |
| Lundstedt; Alan P. | Cincinnati         | OH    |          |         |
| Powers; Tracy A.   | Breckenridge Hills | MO    |          |         |
| Rao; Sudabathula   | St. Louis          | MO    |          |         |
| Stern; Alan J.     | Hamilton           | NJ    |          |         |

US-CL-CURRENT: 504/140; 504/271

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KIMC | Draw De |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|------|---------|
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☐ 7. Document ID: US 5583090 A

L11: Entry 7 of 10

File: USPT

Dec 10, 1996

US-PAT-NO: 5583090

DOCUMENT-IDENTIFIER: US 5583090 A

TITLE: Herbicidal microencapsulated clomazone compositions with reduced vapor

transfer

DATE-ISSUED: December 10, 1996

INVENTOR-INFORMATION:

| NAME               | CITY         | STATE | ZIP CODE | COUNTRY |
|--------------------|--------------|-------|----------|---------|
| Stern; Alan J.     | Defiance     | MO    |          |         |
| Lundstedt; Alan P. | Cincinnati   | OH    |          |         |
| Hakimi; Salim M.   | Chesterfield | MO    |          |         |
| Rao; Sudabathula   | St. Louis    | MO    |          |         |

US-CL-CURRENT: 504/140; 504/271, 504/359

|      |       |          |       |        |                |      |           |           |             |        |     |         |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|-----|---------|
| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KMC | Draw De |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|-----|---------|

☒ 8. Document ID: US H000806 H

L11: Entry 8 of 10

File: USPT

Aug 7, 1990

US-PAT-NO: H000806

DOCUMENT-IDENTIFIER: US H000806 H

TITLE: Herbicidal clomazone compositions and methods of use tolerant to corn and other crops

DATE-ISSUED: August 7, 1990

INVENTOR-INFORMATION:

| NAME                 | CITY            | STATE | ZIP CODE | COUNTRY |
|----------------------|-----------------|-------|----------|---------|
| Keifer; David W.     | Skillman        | NJ    |          |         |
| Tymonko; John M.     | Hamilton Square | NJ    |          |         |
| Felix; Earl D.       | Trenton         | NJ    |          |         |
| Van Saun; William A. | Titusville      | NJ    |          |         |

US-CL-CURRENT: 504/108; 504/100, 504/134, 504/136, 504/137, 504/138, 504/139

|      |       |          |       |        |                |      |           |           |             |        |     |         |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|-----|---------|
| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KMC | Draw De |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|-----|---------|

☐ 9. Document ID: US 4822401 A

L11: Entry 9 of 10

File: USPT

Apr 18, 1989

US-PAT-NO: 4822401

DOCUMENT-IDENTIFIER: US 4822401 A

TITLE: Safening of herbicidal clomazone applications with organophosphorus compounds

DATE-ISSUED: April 18, 1989

h e b b g e e e f e ef b e

## INVENTOR-INFORMATION:

| NAME             | CITY            | STATE | ZIP CODE | COUNTRY |
|------------------|-----------------|-------|----------|---------|
| Tymonko; John M. | Hamilton Square | NJ    |          |         |

US-CL-CURRENT: 504/103; 504/112

|      |       |          |       |        |                |      |           |           |             |        |     |          |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|-----|----------|
| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KMC | Draw. De |
|------|-------|----------|-------|--------|----------------|------|-----------|-----------|-------------|--------|-----|----------|

☐ 10. Document ID: US 4405357 A

L11: Entry 10 of 10

File: USPT

Sep 20, 1983

US-PAT-NO: 4405357

DOCUMENT-IDENTIFIER: US 4405357 A

TITLE: Herbicidal 3-isoxazolidinones and hydroxamic acids

DATE-ISSUED: September 20, 1983

## INVENTOR-INFORMATION:

| NAME          | CITY     | STATE | ZIP CODE | COUNTRY |
|---------------|----------|-------|----------|---------|
| Chang; Jun H. | Lockport | NY    |          |         |

US-CL-CURRENT: 504/271; 548/243, 549/419, 549/434, 556/417, 558/413, 558/414,  
558/416, 560/312, 562/621, 562/623

|      |       |          |       |        |                |      |           |           |             |        |     |          |
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L11: Entry 1 of 10

File: PGPB

Dec 4, 2003

DOCUMENT-IDENTIFIER: US 20030224031 A1

TITLE: Delivery system for pesticides and crop-yield enhancement products using micro-encapsulated active ingredients in extruded granules

Summary of Invention Paragraph:

[0011] Efforts have been made to reduce drift by increasing droplet size, and to reduce volatalization by encapsulating droplets. The product chemistry of the active ingredients sought to be applied also limit the options on the type of product formulation and the manner of application. For example, the prior art teaches a method of liquid encapsulation of the active ingredient in a plastic or a polymer. U.S. Pat. No. 4,405,357, discloses a liquid encapsulation formulation of an active ingredient, sold under the trademark CLOMAZONE. Liquid encapsulation maintains the active ingredient in relatively large droplet form, reducing air-borne drift. In addition, the plastic or polymer outer coating effectively seals off the active ingredient, thereby reducing volatilization and its detrimental effects.

Summary of Invention Paragraph:

[0012] It would be theoretically advantageous to so encapsulate all of the active ingredients in agricultural chemicals, but drawbacks remain. First, the product chemistry of the active ingredients sought to be applied may limit the options on the type of product formulation and the manner of application. Certain active ingredients, individually or in combination with others, are not as suitable for liquid encapsulation as others. Thus, if two or more active ingredients are combined, liquid encapsulation may not reduce the volatilization of the active ingredients as effectively, as with a single active ingredient. An example of this interaction between two active ingredients is the combination of CLOMAZONE and a fertilizer. The fertilizer is a humectant, absorbing water out of the air, thereby increasing the volatility of the CLOMAZONE to the extent that liquid encapsulation is not very effective. Second, liquid encapsulation is quite expensive, so the cost/benefit analysis does not always favor liquid encapsulation as a desired product formulation.



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L11: Entry 2 of 10

File: PGPB

Nov 15, 2001

DOCUMENT-IDENTIFIER: US 20010041659 A1

TITLE: Microencapsulated clomazone in the presence of fat and resin

Summary of Invention Paragraph:

[0001] The present invention relates generally to the field of herbicidal chemical compositions. In particular, the present invention relates to novel compositions of a known herbicidal compound, namely clomazone, designed to reduce clomazone's characteristic volatility, thereby reducing risk of unintended herbicidal activity when clomazone is applied.

Summary of Invention Paragraph:

[0004] Other microencapsulated formulations of clomazone exist that are intended to control the volatile nature of the herbicide. See, e.g., U.S. Pat. Nos. 5,597,780, 5,583,090, and 5,783,520. Unfortunately, these formulations do not provide optimum herbicidal efficacy when compared to commercially available clomazone 4 pound/gallon emulsifiable concentrate (4.0EC) formulation. Given the commercial value of clomazone, improved formulations are therefore needed.

Summary of Invention Paragraph:

[0010] The microcapsules of the present invention provide volatility reduction of about 20-90 percent as compared with clomazone prepared and applied from an emulsifiable concentrate, which is commercially available. The microcapsules of the present invention also provide increased herbicidal efficacy against certain weed species from about one to about four times that of known clomazone microcapsule formulations that are also commercially available. Thus, the practice of the present invention, among other things, enables one to apply clomazone to the appropriate locus for control of weeds in crops while eliminating or substantially diminishing the risk of clomazone injury to plant species located in areas adjacent thereto without the need to resort to expensive and time-consuming pre-plant incorporation or special application procedures.

Summary of Invention Paragraph:

[0018] Although the function of the fat used in the present invention is not fully elucidated, it is believed that the high degree of saturation of the fat used in the present invention, in addition to contributing to the lowering of the natural volatility of the clomazone, also contributes to the lowering of unintended and detrimental reactions that would likely occur between less-saturated solvents or fats and components of the wall of the microcapsule. These unintended and detrimental reactions are referred to as "fugitive reactions", and tend to disrupt the wall structure by forming strands that necessitate an additional filtration step in current clomazone formulation protocols. Generally, the fat used in the context of the present invention is a solid at room temperature, but dissolves in the presence of clomazone, which is a liquid. Accordingly, the clomazone acts as a solvent with the fat that is encased in the microcapsules of the present invention.

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L11: Entry 3 of 10

File: USPT

Aug 27, 2002

DOCUMENT-IDENTIFIER: US 6440902 B1

**\*\* See image for Certificate of Correction \*\***

TITLE: Combination of two or more active ingredients using microencapsulated formulations

Brief Summary Text (2):

Microencapsulated formulations have been developed to answer issues concerning controlled release, volatility, or toxicity of certain active ingredients, thereby providing a means for using such ingredients. Formulations of this type that have been described for the herbicide clomazone (see U.S. Pat. No. 5,597,780), for example, are fragile when in concentrated form. The fragility of the microcapsules interferes with preparing concentrated compositions containing with a second component, because the preparation process tends to release the formerly microencapsulated active ingredient. The present invention describes methods and materials for making such two component concentrates. Also, hitherto microcapsules having two or more different active ingredients have not been described. The present invention provides methods and materials for making such two component microcapsules.

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L11: Entry 4 of 10

File: USPT

Apr 30, 2002

DOCUMENT-IDENTIFIER: US 6380133 B2

TITLE: Microencapsulated clomazone in the presence of fat and resin

Brief Summary Text (1):

The present invention relates generally to the field of herbicidal chemical compositions. In particular, the present invention relates to novel compositions of a known herbicidal compound, namely clomazone, designed to reduce clomazone's characteristic volatility, thereby reducing risk of unintended herbicidal activity when clomazone is applied.

Brief Summary Text (4):

Other microencapsulated formulations of clomazone exist that are intended to control the volatile nature of the herbicide. See, e.g., U.S. Pat. Nos. 5,597,780, 5,583,090, and 5,783,520. Unfortunately, these formulations do not provide optimum herbicidal efficacy when compared to commercially available clomazone 4 pound/gallon emulsifiable concentrate (4.0EC) formulation. Given the commercial value of clomazone, improved formulations are therefore needed.

Brief Summary Text (11):

The microcapsules of the present invention provide volatility reduction of about 20-90 percent as compared with clomazone prepared and applied from an emulsifiable concentrate, which is commercially available. The microcapsules of the present invention also provide increased herbicidal efficacy against certain weed species from about one to about four times that of known clomazone microcapsule formulations that are also commercially available. Thus, the practice of the present invention, among other things, enables one to apply clomazone to the appropriate locus for control of weeds in crops while eliminating or substantially diminishing the risk of clomazone injury to plant species located in areas adjacent thereto without the need to resort to expensive and time-consuming pre-plant incorporation or special application procedures.

Brief Summary Text (20):

Although the function of the fat used in the present invention is not fully elucidated, it is believed that the high degree of saturation of the fat used in the present invention, in addition to contributing to the lowering of the natural volatility of the clomazone, also contributes to the lowering of unintended and detrimental reactions that would likely occur between less-saturated solvents or fats and components of the wall of the microcapsule. These unintended and detrimental reactions are referred to as "fugitive reactions", and tend to disrupt the wall structure by forming strands that necessitate an additional filtration step in current clomazone formulation protocols. Generally, the fat used in the context of the present invention is a solid at room temperature, but dissolves in the presence of clomazone, which is a liquid. Accordingly, the clomazone acts as a solvent with the fat that is encased in the microcapsules of the present invention.

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L11: Entry 5 of 10

File: USPT

Apr 17, 2001

DOCUMENT-IDENTIFIER: US 6218339 B1

TITLE: Microencapsulated clomazone in the presence of fat and resin

Brief Summary Text (1):

The present invention relates generally to the field of herbicidal chemical compositions. In particular, the present invention relates to novel compositions of a known herbicidal compound, namely clomazone, designed to reduce clomazone's characteristic volatility, thereby reducing risk of unintended herbicidal activity when clomazone is applied.

Brief Summary Text (4):

Other microencapsulated formulations of clomazone exist that are intended to control the volatile nature of the herbicide. See, e.g., U.S. Pat. Nos. 5,597,780, 5,583,090, and 5,783,520. Unfortunately, these formulations do not provide optimum herbicidal efficacy when compared to commercially available clomazone 4 pound/gallon emulsifiable concentrate (4.0EC) formulation. Given the commercial value of clomazone, improved formulations are therefore needed.

Brief Summary Text (11):

The microcapsules of the present invention provide volatility reduction of about 20-90 percent as compared with clomazone prepared and applied from an emulsifiable concentrate, which is commercially available. The microcapsules of the present invention also provide increased herbicidal efficacy against certain weed species from about one to about four times that of known clomazone microcapsule formulations that are also commercially available. Thus, the practice of the present invention, among other things, enables one to apply clomazone to the appropriate locus for control of weeds in crops while eliminating or substantially diminishing the risk of clomazone injury to plant species located in areas adjacent thereto without the need to resort to expensive and time-consuming preplant incorporation or special application procedures.

Brief Summary Text (20):

Although the function of the fat used in the present invention is not fully elucidated, it is believed that the high degree of saturation of the fat used in the present invention, in addition to contributing to the lowering of the natural volatility of the clomazone, also contributes to the lowering of unintended and detrimental reactions that would likely occur between less-saturated solvents or fats and components of the wall of the microcapsule. These unintended and detrimental reactions are referred to as "fugitive reactions", and tend to disrupt the wall structure by forming strands that necessitate an additional filtration step in current clomazone formulation protocols. Generally, the fat used in the context of the present invention is a solid at room temperature, but dissolves in the presence of clomazone, which is a liquid. Accordingly, the clomazone acts as a solvent with the fat that is encased in the microcapsules of the present invention.

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L11: Entry 6 of 10

File: USPT

Jul 21, 1998

DOCUMENT-IDENTIFIER: US 5783520 A

TITLE: Microencapsulated herbicidal compositions comprising clomazone and edible oils

Brief Summary Text (12):

In accordance with the present invention there is provided an aqueous dispersion of microcapsules containing a herbicidally effective amount of clomazone dissolved in a suitable water-immiscible high boiling inert organic solvent. The boiling point of the solvent is, preferably, above 170.degree. C. The encapsulant is a porous condensate polymer of polyurea, polyamide or amide-urea copolymer. To provide acceptable volatility control without unacceptable sacrifice of herbicidal efficacy, the percentage of polymer comprising the microcapsules ranges from about 3 to about 20 by weight, preferably about 5 to about 15 by weight, and most preferably from about 5 to about 12 by weight. Also the percentage of solvent of the encapsulated material ranges from about 10 to about 50 by weight, preferably about 15 to 35 by weight, and most preferably from about 20 to about 35 by weight. The microcapsules of the present invention provide volatility reduction of about 20-90 percent as compared with clomazone prepared and applied from an emulsifiable concentrate which is commercially available at the present time. When the composition of the present invention is sprayed or otherwise applied to the surface of soil at the proper dilution for controlling vegetation, it has been found that by encapsulating clomazone dissolved in a suitable water-immiscible inert organic solvent as described and claimed herein, clomazone may be surface-applied directly by spraying and that one may achieve effective weed control in crops without significant damage to neighboring unsprayed vegetation due to vapor transfer of the herbicide. Thus, the practice of the present invention, among other things, enables one to surface apply clomazone to control weeds in crops while eliminating or substantially diminishing the risk of clomazone injury to plant species located in areas adjacent thereto without the need to resort to expensive and time-consuming preplant incorporation or special application procedures.

Drawing Description Text (2):

The accompanying drawing is a graph illustrating the percent volatility suppression improvement for microcapsules of the present invention for a range of percent of encapsulating polymer vis-a-vis a range of percent AE 700 solvent in which the encapsulated clomazone is dissolved.

Detailed Description Text (39):

To compare the percent volatility suppression improvement obtained by the practice of the present invention, various formulations of Example II were evaluated by the just-described test procedure against commercially obtained COMMAND.RTM. 4EC herbicide composed of 47 percent clomazone and 53 percent inerts formulated as an emulsifiable concentrate in side-by-side tests. The improvement in percent vapor transfer reduction (VTR) is seen in Table 3 below.

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L11: Entry 8 of 10

File: USPT

Aug 7, 1990

DOCUMENT-IDENTIFIER: US H000806 H

TITLE: Herbicidal clomazone compositions and methods of use tolerant to corn and other crops

Brief Summary Text (4):

The compound 2-[(2-chlorophenyl)methyl]-4,4-dimethyl-3-isoxazolidinone, hereinafter referred to by the common name "clomazone", is a potent herbicide as evidenced by its ability to control, for full growing seasons and at low application rates in soybean stands, a broad spectrum of grasses and broadleaf weeds that compete with soybeans. As with many herbicides, however, clomazone is not as quickly metabolized by some crops, trees and ornamentals as it is by soybeans. Such intolerance can result temporarily in unsightly yellowing or whitening of the plants unless precautions are taken to prevent or minimize exposure. These precautions include control of surface spraying to forestall drift to adjacent fields planted with low tolerance crops, incorporation into soil during tillage to avoid volatilization due to high temperature and/or moisture, rotation to sensitive crops after specified periods of time following application of clomazone, and thorough cleaning of spray tanks to avoid contaminating other chemicals.

Detailed Description Text (7):

Emulsifiable concentrates are homogeneous liquid or paste compositions dispersible in water or other dispersant, and may consist entirely of a compound of this invention with a liquid or solid emulsifying agent, or may also contain an agriculturally acceptable liquid carrier, such as xylene, heavy aromatic naphthas, isophorone and other non-volatile and other non-volatile organic solvents. For example, a useful emulsifiable concentrate formulation, designated "4EC" because it contains four pounds of active ingredient per gallon of concentrate (0.479 kg/liter), contains 53.01 parts of clomazone, 6.0 parts of a blend of alkylnaphthalenesulfonate and polyoxyethylene ethers and emulsifiers, 1.0 part of epoxidized soybean oil as stabilizer, and as solvent 39.99 parts of petroleum distillate having a high flash-point.

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L11: Entry 9 of 10

File: USPT

Apr 18, 1989

DOCUMENT-IDENTIFIER: US 4822401 A

TITLE: Safening of herbicidal clomazone applications with organophosphorus compounds

Detailed Description Text (9):

Emulsifiable concentrates are homogeneous liquid or paste compositions dispersible in water or other dispersant, and may consist entirely of a compound of this invention with a liquid or solid emulsifying agent, or may also contain an agriculturally acceptable liquid carrier, such as zylene, heavy aromatic naphthas, isophorone and other non-volatile organic solvents. For example, a useful emulsifiable concentrate formulation, designated "4EC" because it contains four pounds of active ingredient per gallon of concentrate (0.479 kg/liter), contains 53.01 parts of clomazone and/or safener, 6.0 parts of a blend of alkyl-naphthalenesulfonate and polyoxyethylene ethers and emulsifiers, 1.0 part of epoxidized soybean oil as stabilizer, and as solvent 39.99 parts of petroleum distillate having a high flash-point.

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L11: Entry 10 of 10

File: USPT

Sep 20, 1983

DOCUMENT-IDENTIFIER: US 4405357 A

TITLE: Herbicidal 3-isoxazolidinones and hydroxamic acids

Detailed Description Text (282):

Emulsifiable concentrates are homogeneous liquid or paste compositions dispersible in water or other dispersant, and may consist entirely of a compound of this invention with a liquid or solid emulsifying agent, or may also contain an agriculturally acceptable liquid carrier, such as xylene, heavy aromatic naphthas, isophorone and other non-volatile organic solvents. For example, a useful emulsifiable concentrate formulation, designated "4EC" because it contains four pounds of active ingredient per gallon of concentrate (0.479 kg/liter), contains 53.01 parts of 2-(2-chlorophenyl)methyl-4,4-dimethyl-3-isoxazolidinone, 6.0 parts of a blend of alkylnaphthalenesulfonate and polyoxyethylene ethers as emulsifiers, 1.0 part of epoxidized soybean oil as stabilizer, and as solvent 39.99 parts of petroleum distillate having a high flash-point.



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L12: Entry 1 of 2

File: USPT

Jan 28, 1997

US-PAT-NO: 5597780

DOCUMENT-IDENTIFIER: US 5597780 A

TITLE: Low volatility formulations of microencapsulated clomazone

DATE-ISSUED: January 28, 1997

## INVENTOR-INFORMATION:

| NAME              | CITY      | STATE | ZIP CODE | COUNTRY |
|-------------------|-----------|-------|----------|---------|
| Lee; Fui-Tseng H. | Princeton | NJ    |          |         |
| Nicholson; Paul   | Trenton   | NJ    |          |         |

US-CL-CURRENT: 504/271; 504/359

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Drawings |
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☐ 2. Document ID: ES 2191067 T3, WO 9614743 A1, AU 9641613 A, ZA 9509724 A, US 5597780 A, EP 792100 A1, BR 9509694 A, CZ 9701416 A3, TW 321585 A, MX 9703575 A1, HU 77708 T, KR 97706728 A, JP 10509709 W, AU 696760 B, AU 9926990 A, IL 115975 A, AU 734106 B, EP 792100 B1, CN 1162902 A, DE 69529471 E, KR 357844 B, CA 2205440 C

L12: Entry 2 of 2

File: DWPI

Sep 1, 2003

DERWENT-ACC-NO: 1996-259473

DERWENT-WEEK: 200365

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TITLE: Prepn. of improved herbicidal clomazone compsns. - with reduced volatility and reduced movement from target area

INVENTOR: LEE, F H; NICHOLSON, P ; LEE, F T H ; LEE, F

PRIORITY-DATA: 1995US-0531499 (September 21, 1995), 1994US-0340699 (November 16, 1994)

## PATENT-FAMILY:

| PUB-NO | PUB-DATE | LANGUAGE | PAGES | MAIN-IPC |
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|----------------------|--------------------|---|-----|------------|
| <u>ES 2191067 T3</u> | September 1, 2003  |   | 000 | A01N025/28 |
| <u>WO 9614743 A1</u> | May 23, 1996       | E | 033 | A01N025/28 |
| <u>AU 9641613 A</u>  | June 6, 1996       |   | 000 | A01N025/28 |
| <u>ZA 9509724 A</u>  | August 28, 1996    |   | 032 | A01N000/00 |
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| <u>EP 792100 A1</u>  | September 3, 1997  | E | 000 | A01N025/28 |
| <u>BR 9509694 A</u>  | October 14, 1997   |   | 000 | A01N025/28 |
| <u>CZ 9701416 A3</u> | December 17, 1997  |   | 000 | A01N025/28 |
| <u>TW 321585 A</u>   | December 1, 1997   |   | 000 | A01N025/04 |
| <u>MX 9703575 A1</u> | August 1, 1997     |   | 000 | A01N025/28 |
| <u>HU 77708 T</u>    | July 28, 1998      |   | 000 | A01N025/28 |
| <u>KR 97706728 A</u> | December 1, 1997   |   | 000 | A01N025/28 |
| <u>JP 10509709 W</u> | September 22, 1998 |   | 036 | A01N043/80 |
| <u>AU 696760 B</u>   | September 17, 1998 |   | 000 | A01N025/28 |
| <u>AU 9926990 A</u>  | July 8, 1999       |   | 000 | A01N025/28 |
| <u>IL 115975 A</u>   | December 6, 2000   |   | 000 | A01N025/28 |
| <u>AU 734106 B</u>   | June 7, 2001       |   | 000 | A01N025/28 |
| <u>EP 792100 B1</u>  | January 22, 2003   | E | 000 | A01N025/28 |
| <u>CN 1162902 A</u>  | October 22, 1997   |   | 000 | A01N025/28 |
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| <u>KR 357844 B</u>   | May 1, 2003        |   | 000 | A01N025/28 |
| <u>CA 2205440 C</u>  | July 29, 2003      | E | 000 | A01N025/28 |

734106 B INT-CL (IPC): A01 N 0/00; A01 N 25/04; A01 N 25/28; A01 N 43/48; A01 N 43/72; A01 N 43/80; C07 D 0/00

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequence? | Attachments | Claims | KWMC | Draw De |
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